Trend Study 19A-2-02

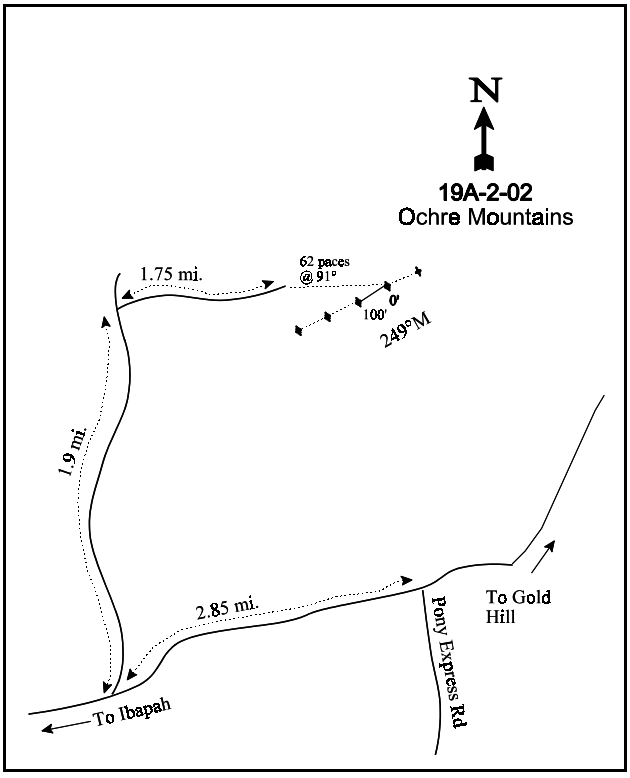
Study site name: Ochre Mountain . Vegetation type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 249 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Gold Hill, proceed southwest toward Pony Express Road. From the intersection at Pony Express Rd, continue on main road (east) towards Ibapah for another 2.85 miles to an intersection going north (right). Take the road going north for 1.91 miles to a road going east (right). Turn right and go 1.75 miles to a small box canyon. Stop and walk 62 paces at an azimuth of 91 degrees true to a green steel “T" fencepost with a red browse tag, number 3931, attached. This marks the 0-foot stake of the baseline. The study is marked by green steel "T" fenceposts approximately 12 to 18 inches in height.



Map Name: Ochre Mountain

Diagrammatic Sketch

Township 8S , Range 18W , Section 17

GPS: NAD 27, UTM 12S 4446113 N 253106 E

DISCUSSION

Ochre Mountain - Trend Study No. 19A-2

The Ochre Mountain study samples deer winter range on the west side of Ochre Mountain. Elevation is approximately 6,200 feet on a 15-20% west facing alluvial swale. The site samples a basin big sagebrush-grass community. The area is surrounded by steep, rocky pinyon-juniper hillsides which contain some Stansbury cliffrose. This transect is in the Ochre Mountain BLM grazing allotment, permitted for cattle use in winter and spring. In 1983, deer use appeared light, however there was considerable evidence of wild horses within the area. No livestock sign was evident on the study site in 1989 and big game use was reported light to moderate. In 1997, there was little evidence of animal use, with only a few fresh deer pellet groups noted. A pellet group transect read on site in 2002 estimated 44 deer days use/acre (107 ddu/ha), 15 elk days use/acre (36 edu/ha), and 4 cow days use/acre (9 cdu/ha). There was also sign of wild horses on the site in 2002. The deer and elk pellets sampled in 2002 appeared to be primarily from late winter and spring. There were several rub trees on the site that had been severely damaged by big game.

Soil is alluvial with an effective rooting depth of 15 inches. The soil type is Shontz Rexmont, a very gravelly soil highly susceptible to water erosion. Textural and chemical analysis indicates soils to be a loam with a neutral pH (7.1). Average soil temperature was 61°F at 17 inches in depth in 1997. Phosphorous levels in the soil profile measured 7.6 ppm, which may be limiting as 10 ppm is considered minimal for normal plant growth and development. Past soil erosion is evident by exposed rock, erosion pavement, and the presence of pedestalled plants. Vegetation and litter cover are currently abundant and effectively minimize erosion on the site. The erosion condition class index was determined as stable in 2002.

Browse composition consists almost entirely of basin big sagebrush. These plants are large averaging 3 feet in height by 4 feet in width. Density was estimated at 2,720 plants/acre in 1997, decreasing to 1,820 plants/acre in 2002. These estimates are much higher than the initial estimate of about 1,300 plants/acre. The difference can be attributed to the increased sample size used in 1997 which more accurately represents the area. The basin big sagebrush population has consisted almost entirely of mature and decadent plants in all years. Percent decadency has been moderate to high in all years, especially during the 1989 (70%) and 2002 (51%) readings which occurred during drought periods. In 1997 and 2002, the proportion of the decadent age class classified as dying was high at over 50%. Recruitment has been low with no young sampled in 2002. The population has had depressed vigor in each reading, with the highest levels of poor vigor being reported during the drought years of 1989 (55%) and 2002 (26%). With the number of dead plants increasing and low reproduction and recruitment, this population appears to be self-thinning with drought conditions. Use was moderate in 1983 and 1989, while mostly light to moderate in 1997 and 2002. Many of the sagebrush plants showed insect damage in 2002. Annual leader growth averaged only 1.7 inches. Other shrubs scattered throughout the area include narrowleaf low rabbitbrush, black sagebrush, ephedra, Stansbury cliffrose, and broom snakeweed.

In 1997, grass cover was dominated by a thick and nearly uniform cover of cheatgrass. This annual grass constitutes a definite fire hazard due to it's abundance and distribution in the area. Cheatgrass poses a severe threat to basin big sagebrush as it is not tolerant of fire and would be eliminated from the site if a burn occurred. Cheatgrass did significantly decrease in nested frequency in 2002 with drought, but was still sampled in almost all of the quadrats. It was noted in 1989 that there was a noticeable lack of cheatgrass relative to 1983 when comparing photographs. Bluebunch wheatgrass was tall and vigorous and provided the most cover of any grass in 2002. Bluebunch declined in nested frequency in 2002, although the decrease was not significant. Sandberg bluegrass is also moderately abundant being sampled in nearly half of the quadrats during all readings. Sum of nested frequency for all perennial grasses declined in 2002, although perennial grass cover slightly increased overall.

With one exception, forbs occur infrequently. Peavine (*Lathyrus brachycalyx*) is moderately abundant with a similar nested frequency values from 1989 through 2002. It provided 95% and 84% of the forb cover in 1997 and 2002 respectively. Other forbs sampled include pale agoseris, longleaf phlox, low fleabane, rockcress, desert Indian paintbrush, and tumble mustard. Perennial forbs showed an increased sum of nested frequency value in 2002 which was surprising due to drought conditions. Forbs often show large declines in frequency during dry periods.

1983 APPARENT TREND ASSESSMENT

This site suffers from poor plant diversity and an overabundance of cheatgrass. The basin big sagebrush stand appears healthy, but constitutes a near monoculture. Herbaceous forage is very minimal. However, in spite of vegetation composition, vegetative trend appears stable. No signs of imminent vegetative change are apparent. Soil trend appears stable to slightly declining. Soils are poorly developed and have little organic content. Soils are also subject to light to moderate sheet and gully erosion.

1989 TREND ASSESSMENT

The soil trend is stable though soils are poorly developed and rocky. The browse trend is slightly downward for basin big sagebrush. Density is stable, but the population shows drastic increases in decadence and poor vigor. One positive factor is that 10% of the population is made up of young plants. The herbaceous understory trend is stable. Sum of nested frequency for perennial grasses slightly decreased, but that of perennial forbs increased with significant increases in peavine and longleaf phlox.

TREND ASSESSMENT
soil - stable (3)
browse - slightly downward (2)
herbaceous understory - stable (3)

1997 TREND ASSESSMENT

Although past erosion is evident, it is currently minimal due to abundant vegetation and litter cover. However, most of the vegetation cover is contributed by cheatgrass. Cheatgrass will slow erosion for a period of time, but for long term soil protection, perennial species are necessary. Soil trend is stable. The basin big sagebrush stand is a mature, decadent stand with little recruitment presently occurring. Fifty-six percent of the decadent plants were classified as dying and there is a dead to live ratio of 1:2.5. The age structure is fluctuating between mostly mature and decadent plants. The population will likely decline in the future with continued competition for spring moisture with cheatgrass. A thinning of the population may in fact allow a healthier remaining population. Even with decreased decadence and poor vigor, the browse trend is slightly down as many plants could be lost from the population. The herbaceous trend is slightly upward. The significant increase in bluebunch wheatgrass nested frequency is a step in the right direction. This site exhibits low diversity, so a significant increase in any perennial species will aid in soil stabilization. Cheatgrass is currently very thick, constituting a fire hazard which could ultimately eliminate the basin big sagebrush population. Forbs, with the exception of peavine, are rare.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - slightly upward (4)

2002 TREND ASSESSMENT

Trend for soil is stable. Bare soil remains low, while vegetation and litter cover are abundant. Cover from perennial grasses and forbs increased in 2002 even with drought. Trend for browse is down. Density of basin big sagebrush declined, whereas decadence and poor vigor increased. The proportion of the decadent plants classified as dying remains high at over 50%, indicating further losses in density could occur in the future. No young plants were sampled in 2002. A high proportion of the population showed insect damage of some kind. With drought conditions and a lot of cheatgrass in the understory, sagebrush is very depressed at the present time. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses declined, but that of perennial forbs increased. Cheatgrass also significantly decreased in nested frequency with the existing drought conditions.

TREND ASSESSMENT
soil - stable (3)
browse - down (1)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 19A, Study no: 2

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron cristatum	-	-	4	-	-	-	2	-	.18	-
G	Agropyron spicatum	a119	a117	b189	b159	51	45	69	63	7.63	11.31
G	Bromus tectorum (a)	-	-	b329	a270	-	-	96	87	10.92	7.61
G	Poa fendleriana	c37	b14	a-	ab3	14	6	-	1	-	.00
G	Poa secunda	b153	ab138	ab121	a98	56	54	43	43	1.63	.91
Total for Annual Grasses		0	0	329	270	0	0	96	87	10.92	7.61
Total for Perennial Grasses		309	269	314	260	121	105	114	107	9.44	12.23
Total for Grasses		309	269	643	530	121	105	210	194	20.36	19.85
F	Agoseris glauca	a-	a-	a-	b19	-	-	-	8	-	.14
F	Arabis spp.	-	6	5	1	-	2	2	1	.01	.00
F	Castilleja chromosa	-	2	1	-	-	1	1	-	.03	-
F	Cirsium spp.	-	-	-	-	-	-	-	-	.03	-
F	Crepis acuminata	-	-	3	2	-	-	1	2	.03	.01
F	Delphinium nuttallianum	-	-	-	3	-	-	-	1	-	.00
F	Descurainia pinnata (a)	-	-	7	4	-	-	4	2	.02	.03
F	Erigeron pumilus	-	8	3	-	-	4	1	-	.00	-
F	Hackelia patens	-	-	2	-	-	-	1	-	.00	-
F	Lathyrus brachycalyx	a145	b193	ab182	b196	56	66	70	76	5.74	8.05
F	Lappula occidentalis (a)	-	-	a-	b41	-	-	-	19	-	.79
F	Lactuca serriola	-	-	-	4	-	-	-	2	-	.03
F	Lomatium spp.	-	-	-	3	-	-	-	1	-	.00
F	Machaeranthera canescens	-	1	1	-	-	1	1	-	.03	-
F	Oenothera spp.	-	8	-	-	-	4	-	-	-	-
F	Phlox longifolia	a4	b25	ab13	b28	2	12	8	14	.06	.14

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Sisymbrium altissimum (a)	-	-	12	14	-	-	7	6	.08	.35
F	Unknown forb-perennial	3	-	-	-	1	-	-	-	-	-
Total for Annual Forbs		0	0	19	59	0	0	11	27	0.10	1.17
Total for Perennial Forbs		152	243	210	256	59	90	85	105	5.96	8.40
Total for Forbs		152	243	229	315	59	90	96	132	6.06	9.57

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 19A, Study no: 2

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Artemisia nova	5	6	.33	.36
B	Artemisia tridentata tridentata	64	50	16.40	16.31
B	Chrysothamnus viscidiflorus stenophyllus	18	14	.30	.71
Total for Browse		87	70	17.04	17.38

CANOPY COVER -- LINE INTERCEPT
Herd unit 19A, Study no: 2

Species	Percent Cover	
	'97	'02
Artemisia nova	-	.33
Artemisia tridentata tridentata	-	13.25
Chrysothamnus viscidiflorus stenophyllus	-	.33

Key Browse Annual Leader Growth
Herd unit 19A , Study no: 2

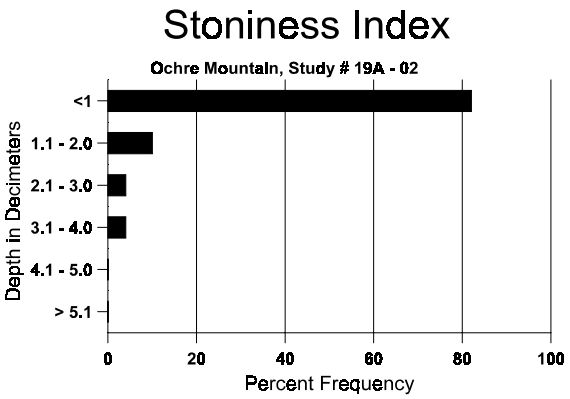
Species	Average leader growth (in)
	'02
Artemisia tridentata tridentata	1.7

BASIC COVER --
Herd unit 19A, Study no: 2

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	376	338	2.00	12.00	39.64	45.36
Rock	179	189	6.75	11.50	5.11	8.21
Pavement	226	247	14.50	11.00	8.30	12.71
Litter	394	382	69.75	62.00	53.55	49.91
Cryptogams	75	70	1.75	1.25	1.38	1.75
Bare Ground	115	129	5.25	2.25	2.58	4.92

SOIL ANALYSIS DATA --
Herd Unit 19A, Study no: 2, Ochre Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.2	61.0 (16.5)	7.1	50.0	32.4	17.6	3.4	7.6	150.4	1.0



PELLET GROUP FREQUENCY --
Herd unit 19A, Study no: 2

Type	Quadrat Frequency		Pellet Transect	
	'97	'02	Pellet Groups per Acre ⁄02	Days Use per Acre (ha) ⁄02
Rabbit	1	2	-	-
Horse	1	1	78	N/A
Elk	-	5	191	15 (36)
Deer	5	18	566	44 (107)
Cattle	5	3	44	3 (9)

BROWSE CHARACTERISTICS --
Herd unit 19A, Study no: 2

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	9	-	-	-	-	-	-	-	-	9	-	-	-	180	9	17	9
	02	-	5	2	-	-	-	-	-	-	1	6	-	-	140	14	23	7
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	-	-	-	2	40			2
	02	4	2	-	-	-	-	-	-	-	-	6	-	-	120			6
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	18%	+15%
'02	54%	15%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		0%
'89	0			0%
'97	220			18%
'02	260			46%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata tridentata																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	-	1	1	-	133			2
	97	3	-	-	5	-	-	-	-	-	8	-	-	-	160			8
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	10	4	-	-	-	-	-	-	-	14	-	-	-	933	43	45	14
	89	2	1	1	-	-	-	-	-	-	3	1	-	-	266	35	39	4
	97	68	12	2	1	-	-	-	-	-	79	4	-	-	1660	34	47	83
	02	35	4	6	-	-	-	-	-	-	17	28	-	-	900	36	46	45
D	83	-	5	1	-	-	-	-	-	-	2	2	2	-	400			6
	89	5	9	-	-	-	-	-	-	-	4	-	8	2	933			14
	97	33	8	3	1	-	-	-	-	-	20	-	-	25	900			45
	02	31	9	4	-	1	1	-	-	-	2	20	-	24	920			46
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	1060			53
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	1580			79

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	45%	05%	10%	- 0%
'89	50%	05%	55%	+51%
'97	15%	04%	18%	-33%
'02	15%	12%	26%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	1333	Dec:	30%
	'89	1332		70%
	'97	2720		33%
	'02	1820		51%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus stenophyllus																		
M	83	6	-	-	-	-	-	-	-	-	6	-	-	-	400	19	20	6
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	16	-	-	5	-	-	-	-	-	21	-	-	-	420	18	24	21
	02	16	-	-	-	-	-	-	-	-	16	-	-	-	320	15	23	16
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	1	-	1	-	133			2
	97	2	-	-	-	-	-	-	-	-	-	-	-	2	40			2
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	-67%
'89	00%	00%	50%	+71%
'97	00%	00%	09%	-26%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	400	Dec:		0%
'89	133			100%
'97	460			9%
'02	340			6%